Government of Canada | Gouvernement du Canada
Policy Research Initiative | Projet de recherche sur les politiques

Public-Private Partnerships for Funding Municipal Drinking Water Infrastructure: What are the Challenges?

Discussion Paper

May 2006

PRI Project
Sustainable Development

Meriem Aït Ouyahia

Canada

Public-Private Partnerships for Funding Municipal Drinking Water Infrastructure: What are the Challenges?

Discussion Paper

May 2006

PRI Project
Sustainable Development

Meriem Aït Ouyahia

106-04716/

About this Report

The PRI contributes to the Government of Canada's medium-term policy planning by conducting cross-cutting research projects, and by harnessing knowledge and expertise from within the federal government and from universities and research organizations. However, conclusions and proposals contained in PRI reports do not necessarily represent the views of the Government of Canada or participating departments and agencies.

PH4-35/2006E-PDF
ISBN 0-662-43362-9

Table of Contents

Executive Summary 1
- Context 1
- Roles, Responsibilities and Challenges for Governments 1
- Conclusions and Possible Policy Research Directions 2
- Recommendations 3

1. Introduction 4

2. Background 6
- 2.1 What are Public-Private Partnerships? 6
- 2.2 Special Features of Water Supply 8
- 2.3 What Does Empirical Research Tell Us About PPPs? 10
- 2.4 How Prevalent is Water Privatization Around the World? 12
- 2.5 ...and in Canada? 16

3. Roles, responsibilities and challenges for governments 16
- 3.1 How to Optimize the Odds of a Successful Partnership? 17
- 3.2 The Lack of Information in the Water Sector 22
- 3.3 Diverging Interests of Investors, Consumers and Government 29

4. Conclusions 36
- Recommendations 37

References 39

Annexe A 46

Public-Private Partnerships for Funding Municipal Drinking Water Infrastructure: What are the Challenges?

Executive Summary

The way drinking water is managed is changing worldwide. The current system, dominated by public provision, is increasingly perceived as inefficient, lacking innovative capacity and in some countries, corrupt. Both developing and developed countries require huge investment capital to meet the basic needs of their population, and the private sector is seen as a way to bring finance and efficiency to the water sector.

However, private investment is still limited compared to other infrastructure sectors. Some of the barriers to efficiency are inherent to the water sector. Public-private partnerships (PPPs) cannot of and by itself remove many of these barriers. As a result, regulatory design and enforcement are crucial elements for water sector performance. Privatization is not a simple retreat of the state, but rather a redefinition of its role as a regulator in a market-oriented economy.

The issue of public-private partnership is always complex, and this is even more so in the case of municipal water supply. This paper provides a critical review of the literature on this topic. Although there is a particular emphasis on lessons learned from and for the Canadian context, Canadian experience of PPPs in the water sector is limited, so most of the relevant literature refers to experiences in other countries which are frequently non-analogous.

Context

During the 1990s, private sector participation in water services provision increased worldwide. But the private sector still serves only about 5 percent of the total world population (and about 18 percent remains effectively unserved). At the end of the 1990s, multinationals started to exit from some contracts and concessions in developing countries and are now reducing their exposure to projects that are not profitable enough or too risky. However, there are still some attractive markets, especially in developed countries, and the main policy stance of many international organizations remains privatization and decentralization.

Roles, Responsibilities and Challenges for Governments

The essential role of government in all forms of PPPs is to define the scope of business, to specify priorities and outputs, and set the tools (through contracts, regulatory agencies, laws, market tools, etc.) for successful PPPs. Experience shows that when legal and institutional frameworks are lacking or too complex and incoherent, the quality and reliability of water provision may be at risk and public-private partnerships may fail. Also, private companies need to be assured of return on investments because investments in the water sector are high and irreversible. Further, there is no 'one size fits all' approach and the choice of a

particular form of partnership should depend on the local context and on its feasibility. Once PPPs are implemented, they need to be regulated to give incentives to the private sector and to protect consumers from monopoly abuse. PPPs are complex, costly, and time-consuming to implement.

There is no empirical evidence of the relative efficiency of the private sector. Empirical results are mixed and do not lead to any robust conclusion in favour of a specific ownership structure. Competition seems to be a greater source of efficiency than the type of ownership. However, unlike the gas and electricity sectors, competition is limited in the water sector. In the United Kingdom, attempts to increase competition have only been partially successful. Auctioning of contracts is the dominant form of competition in the water sector, but it is typically weak. Competitive tenders are costly and time consuming for both bidders and governments and thus rarely occur in practice.

Because of the lack of competition, information cannot be revealed through competition mechanisms, which makes the lack of information in the water sector a bigger constraint than in other utility sectors. Moreover, the private sector usually restricts access to information, which raises the question of how to maintain high levels of transparency and accountability. Thus it is important to involve consumers in the decision process from the beginning. Indeed, the success of PPPs depends on the support of consumers, as they contribute directly (through fees) or indirectly (through taxes) to financing PPPs. It is also important to have tools (legislative rules, monitoring schemes, access-to-information guarantees) to ensure high levels of transparency and accountability.

Finally, the different interests of consumers, investors and government usually lead to frictions and conflicts over the life of the partnership. Governments have broader objectives (environmental and social) than does the private sector, whose main objective is to maximize profit. Periodic bargaining and negotiations over allocation of risks and price setting will be part of the relationship. Furthermore, investments in low-income and scattered areas are too risky for private firms if they have no guarantees. Governments face a trade-off between making investment attractive for private firms and increasing their own risk.

Conclusions and Possible Policy Research Directions

Successfully implementing PPPs in the water sector remains a challenging issue for governments. It is crucial for the government to understand the drivers that attract the private sector to enter into PPPs and to develop the knowledge and skills necessary to deal with unknown and unforeseen circumstances during the partnership. Moreover, because of the lack of systematic evaluation of experience, there is no evidence that the benefits of introducing the private sector offset the costs (transactions costs, regulation costs and the costs of introducing and supporting competition). There is no clear answer to the question of who are the winners and losers of PPPs; results of experiences worldwide are mixed and depend on the circumstances and the design of the contract. Other options should also be considered, as PPPs are clearly not suited to all circumstances.

Recommendations

1. **Good governance**: Principles of good governance are key to sustainable water services and should be at the core of any reform, including PPPs. There is a need to find tools to better implement good governance principles.
2. **Public scrutiny**: Involving the community in the process from the beginning should increase public trust. Contracts should also be made public before they are signed. There is a need to develop monitoring schemes and access-to-information guarantees that ensure accountability by all parties involved.
3. **Systematic project evaluation**: Systematic evaluation of restructuring projects should be done by municipal and provincial governments.
4. **Sharing of information**: If PPPs are to go forward, there is a need for a central system that would collect information on projects and allow for sharing of experiences.
5. **Independent regulator and oversight of PPPs**: It would be worthwhile to evaluate the potential benefits and costs of having an independent regulator, most probably at the provincial level.
6. **Other options have to be considered**: It is necessary to consider the advantages and disadvantages of many options before selecting one. There is also a need to better understand under what circumstances PPPs are a suitable solution.

1. Introduction

In the early 1990s, with the increasing awareness of environmental degradation and increasingly widespread water stress, the United Nations and the international community started to take freshwater issues more seriously. With the "Dublin principles" (see Box 1) that emerged from the International Conference on Water and the Environment in Dublin and were reiterated during the 1992 UN Conference on Environment and Development in Rio, market-driven approaches for water resources management gained acceptance. Water was recognized as an economic good, i.e., a commodity that should be priced at its cost of provision (including environmental externalities) and its true value to society.

Box 1: Dublin Principles

In 1992, 500 participants, including experts representing 100 countries and 80 international, intergovernmental and non-governmental organizations, attended the *International Conference on Water and the Environment* (ICWE) in Dublin, Ireland. At its closing session, the Conference adopted the Dublin Statement.

The Statement's four Guiding Principles provide the framework for future actions:

- Principle No. 1: Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- Principal No. 2: Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.
- Principle No. 3: Women play a central part in the provision, management and safeguarding of water.
- Principle No. 4: Water has an economic value in all its competing uses and should be recognized as an economic good.

Source:
<http://www.wfeocomtech.org/WorldWaterVision/DublinStatementH20AndSD.html>

The World Bank is a major international actor in the infrastructure sector both in terms of financial aid and decision-making in developing countries. Its main role is to ensure infrastructure development in poor and emerging countries. Until the 1990s, World Bank policies were mainly based on Keynesian and classical economics. Market failures were recognized to occur quite often in the infrastructure sectors due to natural monopoly, externalities, and the public good aspect of many infrastructure projects. Therefore, the government was seen as the main actor in the infrastructure sector. However, in the 1990s, with the increasing influence of neoclassical economics, the World Bank's policy changed (1994 World Development Report). Market failures were replaced by state failures. Government was identified as a major impediment to infrastructure development:

the public sector has been characterized as lacking innovative capacity, inefficient, unable to compete in world markets, and corrupt.

In developed countries, the appropriate roles of the public and private sectors are also questioned. The current system dominated by public provision is perceived as inefficient and the private sector is touted as a way of bringing innovative approaches, efficient management and cutting the cost of public subsidies or redirecting them to the poor. This radical change in public policy has occurred worldwide and for all infrastructure sectors. Privatization and decentralization have become the main reform policies of the major international organizations (World Bank, International Monetary Fund, Organisation for Economic Co-operation and Development). In most industrialized countries, decentralization policies and decline in government subsidies are occurring at a time when infrastructure needs to be renewed, whereas for developing countries and transitional economies the main challenge is investment in new infrastructure. This financial need to maintain and improve infrastructure and to construction new works explains why private sector involvement is increasingly sought after in the water sector. Indeed, it is often described as a means of tapping into vast pools of private capital to reap savings for the public purse.

However, private involvement in the water sector remains a controversial issue. Unlike the telecommunications and electricity sectors, competition is very limited in the water sector. The international water market is dominated by two French multinationals, Suez and Veolia (formerly Vivendi), and experience does not show any successful competition model. Moreover, the costs of implementing public-private partnerships (PPPs) are usually high. Private involvement by itself cannot remove the barriers that impede the public sector's efficiency. Without strong regulations, private monopolies may replace state ones – but tight regulations may hinder market forces. There is no consensus in the water sector on how to promote competition, the roles of the public and private sectors, and the institutional arrangements for regulation. It might well be that privatization reform leads to more state involvement than expected. The question of the role of the government in the water sector and in infrastructure development is thus crucial.

The issue of public-private partnership is always complex, and this is even more so in the case of municipal water supply. This paper provides a critical review of the literature on this topic. Although there is a particular emphasis on lessons from and for the Canadian context, Canadian experience of PPPs in the water sector is limited, so most of the relevant literature refers to experiences in other countries which are frequently non-analogous.

This paper identifies the roles, responsibilities and challenges of private sector involvement in water infrastructure from a government perspective. The first section addresses what is meant by public-private partnerships, presents the special characteristics of water services, reviews empirical research on PPPs, and ends with a broad picture of the private sector's involvement worldwide. The second section identifies how to optimize the chance of a successful partnership,

and explores the issues of lack of information in the water sector and of conflicting interests between investors, consumers and government. The conclusion proposes possible research directions and recommendations to attain a better understanding of the optimal design of PPPs under specific circumstances and of their true benefits and costs.

2. Background

2.1 What are Public-Private Partnerships?

Partnerships are found in many different types and sizes, and the boundaries between public and private are sometimes blurred, which makes public-private partnerships (PPPs) difficult to classify and to clearly define. "It is as if, on finding two boxes labelled public and private, we were to open the private box and find two more boxes labelled public and private, which we would do again and again, opening ever smaller boxes until we reached the individuals far inside, whom we could then split into respective offices and persons." (Starr, 1988: 10).

Box 2: Privatization, Liberalization and Commercialization

It is important to note that privatization, commercialization and liberalization are three different concepts. Commercialisation refers to the use by the public sector of private sector management practices, such as commercial practices and goals, management and organizational styles drawn from the private sector (Bakker, 2003a).

In economic terms, privatization is the transfer of ownership and/or management of supply of goods and services from the public sector to the private sector, and thus includes: the total or partial sale of assets by the state; the transfer of assets to the private sector under leasing arrangements; and management contracting arrangements.

Neither privatization nor commercialization necessarily implies liberalization (or deregulation), which is the introduction of competition and the removal of laws and regulations that restrict the market competition. For instance, in England and Wales, water companies remained monopolies even after privatization (Bakker, 2003a).

In this paper, we will consider PPPs to be any "contractual arrangement between a public sector agency and a for-profit private sector concern, whereby resources and risks are shared for the purpose of delivery of a public service or development of public infrastructure" (Akintoye et al., 2004: 4). This can include everything from service contracts to full privatization (see Table 1). Hybrids and combinations of these models also occur. This definition comes from the National Council for Public Private Partnership of the United States and is in line with the World Bank models of private participation.

These forms of privatization differ in the magnitude to which they move ownership, finance, and accountability out of the public sector and into private hands. For instance, with a service contract (operations, management and sometimes leases), a government subcontracts operations and maintenance for a period of time (typically five to seven years). The government pays a predetermined fee for the service and sets a performance standard to be met. There is no implied financial risk for the private contractor or responsibility for investment, although under a leasing arrangement (the French 'affermage' system) companies may be responsible for network maintenance, which could involve significant expenditure. In contrast, with a concession, which usually lasts 20 to 30 years, the private contractor has full responsibility for all capital and operating costs. In return, the contractor receives all revenue and is the residual claimant (receiving whatever is left from the income after all other expenses have been deducted). The tariff level is established by the concession contract with specified performance targets. Assets are returned to the public utility at the end of the contract, and the private firm is compensated for its own investment that is not fully amortized (OECD, 2000). Finally, full privatization is the same as a concession but with a transfer of the ownership of assets to the private sector, rather than the more lease-like arrangement of a concession.

It is worth noting that in all cases, the public sector remains responsible for regulation and monitoring performance (see Table 1), hence privatization does not necessarily result in less government spending and regulation.

Table 1: Allocation of Public/Private Responsibilities Across Different Forms of Private Involvement in Water Services

	Setting Performance Standards	Asset Ownership	Capital Investment	Design & Build	Operation	User fee Collection	Oversight of Performance and Fees
Fully Public Provision	Public	Public	Public	Public	Public	Public	Public
Passive Private Investment	Public	Public	Public/ Private	Public	Public	Public	Public
Design and Construct Contracts	Public	Public	Public	Private	Public	Public	Public
Service Contract	Public	Public	Public	Public	Private	Public	Public
Joint Ventures	Public	Public/ Private	Public/ Private	Public/ Private	Public/ Private	Public/ Private	Public
Build, Operate, Transfer	Public	Public	Private	Private	Private	Public	Public
Concession Contracts	Public	Public	Private	Private	Private	Private	Public
Passive Public Investment	Public	Private	Public/ Private	Private	Private	Private	Public
Fully Private Provision	Public	Private	Private	Private	Private	Private	Public

Source: OECD, 2000.

2.2 Special Features of Water Supply

Water supply has many characteristics that challenge private involvement and that make regulatory design and enforcement crucial determinants of PPPs performance: high investment specificity, natural monopoly features of the sector, buried assets, externalities involving public health and environment, the need for universal provision and the fact that water supply is location-specific. All of these may be barriers to the potential benefits of private sector involvement, and are discussed below.

Drinking water infrastructure includes treatment and storage plants and distribution systems. All these long-lived assets require intensive fixed capital investment. Indeed, the fixed costs of water supply are typically high relative to variable costs, especially when compared with other utilities. In England and Wales, fixed costs represent 80 percent of total cost (Armstrong et al., 1994). Moreover, a large portion of water infrastructure is fixed in place and has no alternative uses, which means that a large part of the fixed costs are irreversible. Thus asset specificity is relatively high, which increases the political and regulatory risks (see Box 3) for a private company.

Box 3: Different Forms of Risks

- **Construction risks** occur with new developments or system renovation, it is the risk that costs exceed expectations;
- **Commercial risks** are the risks of changes in the market structure;
- **Financial risks** are the risks of increased interest rates on borrowed capital or of shifts in exchange rates;
- **Regulatory risks** occur with change in regulation (higher standards requirement, price ceiling, etc.);
- **Political risks** are due to political instability.

Source: Rees (1998: 98).

The fact that water infrastructure is capital intensive also means that a water company's revenues are principally returns to capital and that amortization periods are long (Kessides, 2004). Moreover, if the industry is mature and demand becomes stagnant, profits will depend heavily on price increases (Bakker, 2003a: 154). But the private sector may face political difficulties when prices need to be raised.

Another characteristic of water infrastructure is that 70-80 percent of water and wastewater assets are underground (Infrastructure Canada, 2004). Hence obtaining accurate information about them can be costly and there is generally a lack of reliable information about the condition of existing infrastructure. This can discourage some potential investors (Rees, 1998) or be a source of conflict

and costly renegotiations after the contract has been signed (Brook Cowen, 1997). It may also be difficult to judge the quality of the work done by a private provider in a short period of time. "Where the contract involves underground assets it is often difficult to monitor performance quality, and the effect of shoddy work may not become evident during the contract period." (Rees, 1998: 101).

The high fixed costs of water systems lead to economies of scale that contribute to conditions of natural monopoly. Only infrastructure construction is competitive. Transportation, treatment and distribution of water are all normally spatial monopolies. Since competition in the water sector is limited, it is unlikely that only a change in ownership or management will improve performance. Improvement in performance will depend on the ability to introduce competitive pressure in the sector and on the regulatory system, not on the ownership structure.

Many externalities[1] arise from the capture, treatment, storage, distribution and use of water. A thorough list of externalities related to water is difficult to establish because externalities depend on location and context. But it is possible to classify them by where along the supply chain (extraction, storage, distribution, use and disposal of water) the impact is generated (see Table 2; Van Bueren and Hatton Macdonald, 2004). In addition to the direct impact, some externalities can have spillover effects. Moreover, many of the health and environmental externalities that arise from water-related activities can be diffuse and long term, making them difficult to identify and prevent. "...externalities are more important in water and sewerage than they are in other network industries, increasing the potential scope of regulation beyond simple price." (Clarke et al., 2004: 2).

[1] An externality is any impact (positive or negative) that a transaction has on individuals who are not involved in it and which is not factored into the costs to the transaction participants.

Table 2: Examples of Water-Related Externalities (This list is illustrative only, not exhaustive.)

	Direct impacts on people and ecosystems	Indirect impacts
Extraction	Reduced flushing of floodplains (-) Creation of sulfidic materials (-)	Reduced amenity (-) Lost biodiversity (-)
Storage stage	Flood migration (+/-) Reduced downstream flows resulting in degraded streambank vegetation, aquatic weeds and potentially higher salinity (-) Barriers to fish (-) Habitat disturbance at dam site (-)	Dam site recreation (+) Heritage value of dams (+) Boating on reservoirs (+) Decreased amenity values (-) Opportunity for hydro-electric generation (+) Reduced fishing opportunities downstream of dam (-)
Use	Salinity induced through rising groundwater tables (-)	Agricultural yield loss and infrastructure damage (-)
Distribution and inter-storage transfers	Disease transfer (-) Flow-related damage (-) Temperature pollution (-)	Threat to local fish populations (-)
Disposal stage	Algal blooms (-) Degraded streambank vegetation (-) Damage to seagrass (-)	Reduced recreation (-) Reduced recreational and commercial fishing (-) Reduced amenity (-)

Source: Modified from Van Bueren and Hatton Macdonald, 2004.

Because safe water is essential for life and health, its access and affordability for all is important for the welfare of society. The requirement for universal provision leads to a trade-off between efficiency and social welfare objectives. This implies that the government will be heavily involved in regulating water services, increasing regulatory and political risks for private companies.

Finally, because water has a low unit value compared to its conveyance costs, water systems tend to be highly fragmented in local distribution networks (Kessides, 2004). This can lead to complex inter-jurisdictional issues that can increase the difficulty of involving the private sector (Cowen Brook, 1997). It also limits the potential for economies of scale.

2.3 What Does Empirical Research Tell Us About PPPs?

There are few empirical studies evaluating the effects of public-private partnerships (including full privatization). Since PPPs are difficult to characterize empirically, most of the studies focus on the two extremes of public and private ownership. Furthermore, there are few empirical examinations of situations where restructuring (changes in the organizational and institutional structure of management systems) has been implemented instead of, or prior to, full privatization (Meggison and Netter, 2001). Moreover, it is difficult to draw any robust conclusion from these empirical studies in favour of a specific ownership structure (for details see Renzetti and Dupont, 2004).

The empirical literature uses different approaches to compare the performances of public and private ownership. One approach focuses on the cost function for water utilities, assuming that firms, either public or private, minimize costs (Crain and Zardkoohi, 1978; Bruggink, 1982; Raffiee et al., 1993; Bhattacharyya et al.,

1994; Saal and Parker, 2000). "Morgan (1977) and Crain and Zardkoohi (1978) found that private water utilities have, on average, lower costs. Conversely, Bruggink (1982), Feigenbaum and Teeples (1983), and Teeples and Glyer (1987a, b) found either no cost difference or that public utilities have lower costs." (Renzetti and Dupont, 2004: 1869).

Some economists would argue that the assumption of cost minimization is not always true, especially when ownership and management are separate. Hence, Lynk (1993) and Bhattacharyya et al., (1995) use a cost frontier approach. They define inefficiency as the difference between actual cost and its theoretical optimal value on a cost frontier and they analyze whether this variable may be explained either by ownership or by other firm-specific characteristics. Lynk (1993) found that, on average, private and public firms are 11.5 percent and 2 percent respectively above their own cost frontier, while Bhattacharyya et al. (1995) found that private and public firms deviate by 19 percent and 10 percent respectively from minimum cost. Hence, according to both of these studies, public firms are more efficient.

Another approach focuses on productivity. For example, Saal and Parker (2001) measure the performance of the water and sewerage industry in the United Kingdom before and after privatization using indices of labour and total factor productivity (TFP). Labour productivity (units of output per unit of labour) and total factor productivity (units of output per unit of all inputs) are measured in terms of the growth rate of labour and all inputs used respectively. The authors found that while labour productivity improved after privatization, total factor productivity decreased – implying that privatization resulted in the substitution of other inputs for labour. They also found that privatization resulted in higher profits but few efficiency gains.

Most research examines improved performance in term of efficiency and productivity, and neglects the effects on consumers, such as water quality, reliability, and prices. "One of the principal reasons for launching privatizations is consumer dissatisfaction with a public firm's service. However, few studies examine the effect of privatization on consumers." (Meggison and Netter, 2001: 347). Orwin (1999) and Houstma (2003) both provide evidence that, on average, private firms charge higher prices than public ones in France and California, respectively. Ballance and Taylor (2005) report on a study of water prices in France in May 2001 by the French Ministry of Agriculture and the French Environment Institute. The study is based on a survey of 5000 municipalities and covers 68 percent of the French population. They found that, on average, water delivered by private companies is 27 percent more expensive than that delivered by public operators. However, Buller (1996) shows that there are more private firms in areas where costs of supply are higher, suggesting that privatization is more likely where costs are higher, and giving a possible explanation of why prices to consumers are higher with private firms.

Moreover, empirical studies testing the effect of ownership on performance often assume that other factors remain constant. This can bias the result as factors

other than ownership can affect the performance of a utility or a firm and are rarely constant between cases. Renzetti and Dupont (2004) identify three main influences on day-to-day performance that seem to outweigh ownership: the size of the firm or utility, the physical environment, and the policy and regulatory environment.

Because of the high initial investments needed in water supply, a larger firm may be able to produce more and hence enjoy economies of scale as the cost per unit decreases. For example, Bhattacharyya et al. (1995) found that large public firms are less inefficient than comparable private firms while the reverse is true for small utilities. However, even if it might seem that a larger firm would be more profitable and efficient than a smaller one, producing more output with a given amount of input (technical efficiency) does not necessarily lead to allocative efficiency (the output is produced at the lowest cost possible): "...Few studies control for the possible use of market power by the privatized firms. That is, performance improvements could be due to greater exploitation of monopoly power, which has harmful effects on allocative efficiency, rather than productive efficiency." (Megginson and Netter, 2001: 347).

The physical environment is also important, as a firm with an unreliable supply of poor quality water will likely have a higher cost than one supplied with reliable clean water. Others factors such as topography, population density and the type of customer mix also have a significant impact on performance (Renzetti and Dupont, 2004).

Finally, water quality standards, health and safety regulations, as well as tax rules and pricing also influence performance. For example, Saal and Parker (2000) test whether it is privatization or stronger price regulation that has affected water industry costs by including time dummy variables in the estimated cost function. "The privatization dummy was insignificant but the price regulation dummy's coefficient was negative and significant. This result suggests that only price regulation has had a discernible influence on costs." (Renzetti and Dupont, 2004: 1873). Moreover, differences in performance may be caused by differences in regulations across jurisdictions or by the fact that regulations are applied differently between public and private utilities. For example, Seidenstat et al. (2000) argued that if the different tax rules and regulations are not taken into account the studies are biased in favour of public utilities.

Empirical studies do not lead to any firm evidence about the relative efficiency of private or public ownership.

2.4 How Prevalent is Water Privatization Around the World?

Two main models exist in the water sector: the English model of full privatization, where ownership and management are private, and the French model of delegated management (lease and concession contracts), where the ownership is in public hands and the management is a mix of public and private systems. The English model occurs mainly in England and Wales, whereas the French model, heavily

promoted by the World Bank, has been exported in various forms in developed and developing countries.

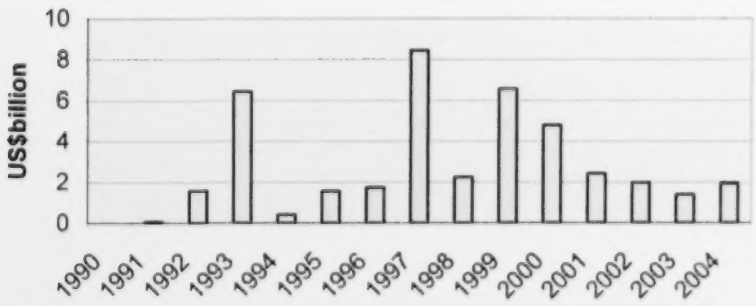
Worldwide, the private sector operates only a small amount of the water supply. "Of the total of the world population of 6 billion, only about 5 percent are served by private companies. Of [these] 290 million people, 126 million are in Europe, 72 million in Asia and Oceania, 48 million in North America, 21 million in South America, and 22 million in other countries." (Stephenson, 2005: 265).

According to Stephenson (2005), the water market[2] represents about US$400 billion per year internationally, compared to US$1,000 billion per year for electricity. "The market is largely in western Europe (30 percent), followed by Asia (28 percent), North America (25 percent) and in decreasing order, Eastern Europe (5 percent), Latin America, Oceania, and Africa." (Stephenson, 2005: 265).

Private water infrastructure projects in developing countries increased in the 1990s with a peak in 1997, and have declined since 1999 (see Figure 1). However, in 2004, annual investment flows grew by 36 percent, a return to the activity level of 2002. Chile, China and Mexico accounted for 90 percent of investment flows and 70 percent of projects in 2004 and there were no new projects in South Asia and Sub-Saharan Africa in 2004 (Izaguirre and Hunt, 2005).

Despite the decreasing involvement of the private sector in recent years in some developing countries, the expansion since the beginning of the 1990s is significant.

Figure 1: Investment Commitments in Water and Sewerage Projects with Private Participation in Developing Countries, 1990-2004



Source: World Bank, PPI Project Database.

However, private sector participation in water infrastructure remains small when compared with the public sector: only 3 percent of the population in poor or emerging countries is supplied through fully or partially private operators

[2] This is only for urban water consumption, i.e., residential, commercial and industrial, but it includes potable water supply and wastewater collection and treatment.

(Winpenny, 2003). Moreover, compared to other infrastructure projects with private participation, water projects attracted only 5 percent of the investment commitments in developing countries (Izaguirre and Hunt, 2005), which is also small relative to the sector needs to meet the Millennium Development Goals in water and sanitation.

The trends in developing countries show that water projects became smaller in 2001-2004 compare to 1995-2000 and involved more management contracts than concession or lease contracts. Indeed, average annual investment flows in water utilities decreased from US$3.6 billion in 1995-2000 to US$1.1 billion, while the annual number of projects barely changed, from 28 in 1995-2000 to 27 in 2001-2004 (Izaguirre and Hunt, 2005). The number of lease contracts fell from 19 in 1995-2000 to 9 in 2001-04, while management contracts increased from 10 to 18. Similarly, concessions declined in both number and size.

In Asia, privatization was introduced to reduce budgetary deficits, increase economic growth, develop capital markets and improve services. It is interesting to note that even if water multinationals are reducing their exposure from contracts that are inadequately profitable or too risky in Asia generally, they treat China as a special case: of the 38 projects in East Asia and the Pacific, 24 took place in China.[3]

In Latin America, privatization was launched mainly because of heavy political control of public utilities in more countries and government corruption. Privatization and decentralization have been at the centre of the structural reform process over the last 20 years. In Chile, new legislation to modernize the water sector was passed as early as 1988. At the end of the 1990s almost all Latin American countries had some form of private sector participation or were considering reforms to facilitate it. However, the depth of reform varies substantially across countries and is relatively small compared to what has been achieved in the electricity or telecommunications sectors. By the end of the 1990s, 14.8 percent of urban water consumers in Latin America were served by some form of PPP (Foster, 2005).

Because of financial pressure, more than 30 African countries have decided to let the private sector operate and invest in their water infrastructure (Finger and Allouche, 2002). In Sub-Saharan African countries, the main problems are poverty and rapid urbanization. Privatization is seen as a possible way to provide access to water and sanitation for the poor. However, in 2004, there was no private sector investment in new water projects (Izaguirre and Hunt, 2005).

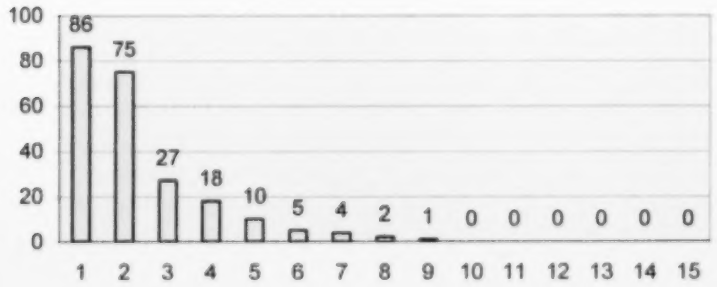
Central and Eastern European countries have a water infrastructure that is much more developed than in developing countries. The reasons for private sector participation are also more ideological, part of the transition from communism to market economies (Finger and Allouche, 2002). Liberalization and privatization reforms have happened very quickly in the CEE countries as private companies

[3] World bank, PPI Project Database.

are aggressively taking over water utilities. It is estimated that private water companies already serve about 8 percent of the urban population in Russia and this is expected to increase (Hall et al., 2003).

In Europe, apart from France and the United Kingdom, water is predominantly publicly supplied (see figure 2). In France, the private sector provides water to 75 percent of the population, in the U.K. 86 percent, and in Spain 27 percent (Hall, 1997). In France, municipalities are in charge of water supply and they award concessions or contracts to private companies, whereas in the U.K., water companies own state-allocated regional firms and each company operates only in its own region. Three major groups in France operate almost all the privatized water utilities through local subsidiaries; Suez, Veolia (formerly part of Vivendi) and Saur. Italy continues to pursue industry consolidation and to increase private sector participation. Contrarily, in the Netherlands, water is provided through public utilities and a law was recently passed (September 2004) preventing any privately owned company from providing drinking water services to the public (Hall et al., 2005).

Figure 2: Private Water Supply in the EU (Percentage of Population Supplied by Private Sector)



Note: (1) United Kingdom; (2) France; (3) Spain; (4) Germany; (5) Finland; (6) Belgium; (7) Italy; (8) Sweden; (9) Portugal; (10) the Netherlands; (11) Denmark; (12) Luxembourg; (13) Austria; (14) Ireland; (15) Greece.
Source: Modified from Hall, 1997.

In the United States, private involvement remains limited but is expected to increase. Privately owned water systems are located primarily in small communities, whereas the more common approach to privatization in larger cities is operating contracts,[1] which increased in the 1990's. "In the United States, there are approximately 50,000 community water systems. Of these, 43 percent are publicly owned, 33 percent privately owned, and 24 percent are classified as "ancillary systems" (i.e., systems serving very small communities such as trailer parks). However, because most private systems are relatively small, public water

[1] Operating contract, as mentioned in section 2.1 does not imply any financial risk for the private contractor or responsibility for investment.

systems serve 86 percent of American households while private systems supply only 13 percent." (Bakker, 2003b: 39).

2.5 ...and in Canada?

In Canada, privatization of water systems is even more limited, and most of the time private involvement takes the form of operating contracts for publicly owned utilities, as in the United States. The exception is British Columbia, where there are 187 privately owned utilities, which are, however, mostly very small. "More than half of these utilities are very small, serving fewer than 50 customers in trailer parks, resort areas, subdivisions, or isolated communities. The largest – White Rock Utilities – has been operating since 1913 and supplies 18,500 people." (Brubaker, 2003: 5). Moreover, most PPP contracts are relatively recent, and limited information exists about the performance of PPPs in Canada (Bakker, 2003b).

In the province of Ontario, despite the fact that privatization became a major provincial objective in 1996, private involvement in the water sector is rare. According to estimates, between 30 and 52 of the 672 water systems serving Ontario's municipalities had some private sector involvement in 2002 (Brubaker, 2003), and most private sector involvement is in small communities. However, in December 1994, Philip Utilities Management Corporation entered into a 10-year operations and maintenance contract for the water supply systems serving Hamilton-Wentworth without a competitive bidding or pre-tendering process (Bakker, 2003b). The company was taken over by Azurix Corporation, an affiliate of Enron Corporation, in May 1999, and two years later by American Water Works. In 2003, a German multinational, RWE Thames, acquired American Water Works. Water services returned to public management in 2004. More recently, in 2001, London, Ontario, and 20 communities in the surrounding region entered into a 10-year operations and maintenance contract with Azurix North America, and then American Water Works (Brubaker, 2003).

Worldwide, the role of the private sector in water management and financing has increased compared to the early 1990s, however, private investment remains limited compared to other infrastructure sectors and relative to the needs in this sector. Moreover, over the period 2001-2004, water multinationals have limited their investment to selected developing countries and withdrawn from underperforming contracts. "RWE Thames announced that it would withdraw from most regions while focusing on Central and Eastern Europe, Veolia Environment that it would concentrate on selected Asian countries, and Suez that it would pull out of Asia and Latin America." (Izaguirre and Hunt, 2005: 4).

3. Roles, Responsibilities and Challenges for Governments

The characteristics of water services, presented in section 2.2, have challenged private sector involvement. "Privatization has proven to be more difficult and more controversial in water and sewerage than in other sectors." (Clarke et al., 2004: 1). Public-private partnership cannot of itself and by itself remove many of

the barriers to efficiency which hinder public sector operations. As a result, regulatory design and enforcement are crucial elements for water sector performance. Privatization is not a simple retreat of the state, but rather a redefinition of its role as a regulator in a market-oriented economy.

The essential role of the government in all forms of PPPs is to define the scope of business, to specify priorities and outputs, and set the stage (through contracts, regulatory agencies, laws, market tools, etc.) for successful PPPs. Experience shows that when legal and institutional frameworks are lacking or too complex and incoherent, the quality and reliability of water provision may be at risk and public-private partnerships may fail. Also, private companies need to be assured of return on investments in the water sector because investments are high and irreversible. Further, there is no "one size fits all" approach and the choice of a particular form of partnership should depend on the local context and on its feasibility. Once PPPs are implemented, they need to be regulated to give incentives to the private sector and to protect consumers from monopoly abuse, which can be a difficult and costly task. "France's experience with private provision of water services clearly demonstrates the importance and difficulty of regulating providers of basic services [...] Sharp increases in customer fees, reports of contamination of 'post-privatization' drinking water, and corruption between company executives and elected officials have been reported." (OECD, 2000: 15).

Experience also shows that operational and economic efficiency has more to do with competition than with the type of ownership (Vickers and Yarrow, 1989). In the water sector, competition is limited, which makes asymmetric information a bigger constraint (since information cannot be revealed through competition mechanisms). Moreover, the private sector usually restricts access to information, which raises the question of how to maintain high levels of transparency and accountability.

Finally, the different interests of consumers, investors and governments usually lead to conflicts. Governments have broader objectives (environmental and social) than the private sector, whose main objective is to maximize profit. It is important for governments to understand the motives of private sector firms for entering into PPPs and to develop the skills to manage unforeseen circumstances over the life of the partnership. Periodic bargaining and negotiations over allocation of risks and price setting will be part of the relationship. Furthermore, investments in low-income and scattered areas are too risky for private firms if they have no guarantees. Governments face a trade-off between making investment attractive for private firms and increasing their own risk.

3.1 How to Optimize the Odds of a Successful Partnership?

The way water is managed is changing, and the increasing involvement of the private sector needs to be accompanied by organizational and institutional adjustments. The recent approach to adjusting regulatory frameworks focuses on the need to provide credible protection for private investors so that they can be confident of earning a return on the capital that they have invested (Levy and

Spiller, 1996). Another approach focuses on the need to protect consumers from monopoly abuses. To attract private sector investments and to protect consumers, a stable and coherent institutional framework is needed. To better assess which form of private participation is feasible, there is a need for analyses of local conditions. There is also a need to develop tools to measure and monitor the private sector and for strong enforcement mechanisms. Public-private partnerships, other than basic service contracts, are complex and time-consuming to implement, and should thus be entered into only after correspondingly thorough cost-benefit assessments.

3.1.1 A Stable and Coherent Institutional Framework

Public-private partnerships are mostly regulated by contract. Experience shows that institutions and policies in developing countries are not well-adapted to incorporating the private sector. There is a lack of legislation, and the administrative structure and the judicial system are both deficient in human and financial capacities (Finger and Allouche, 2002). To protect consumers and private operators, private participation needs to be preceded by substantial institutional developments in developing countries. In developed countries, it is not the lack of legislation but the various, complex and overlapping legislation (which often occurs especially when different levels of government are involved) that can increase private investors' regulatory risks (Essig et al., 2000: 91).

Decentralization of functions from national to municipal government has occurred worldwide. As a consequence, the roles of the different levels of government involved have changed. Municipalities find themselves with new functions. The idea behind decentralization is to bring decision making to the lowest appropriate level, to strive for integrated water resources management. One of the positive consequences is that it should increase consumers' influence on quality of service and prices. However, it can also challenge private sector involvement. Indeed, decentralization can lead to uncertainties in the allocation of responsibilities across national, provincial, and local authorities. Moreover, many municipalities have little experience dealing with the private sector on such a scale or exercising the required type of regulatory functions. Finally, if the municipality is too small, the transaction costs associated with substantial private investment might be too high (OECD, 2000).

In France, many of the strengths of the public-private partnerships system come from its strong institutional foundations. Municipalities are in charge of water and sewerage services and PPPs are regulated by contracts (see Box 4), but there are also several national and regional authorities that regulate aspects of the water sector. Also, on top of the general regulatory arrangements such as water quality and environmental regulation that apply to both public and private providers, specific regulatory arrangements apply to the organization and conduct of private participation in the water sector. There are legislative rules from the national level that constrain municipalities' freedom of action in organizing and selecting a private partner. For example, the 1993 Sapin law seeks to increase the level of transparency and competition in awarding delegation contracts and to improve

the capacity of municipalities to enforce those contracts. Furthermore, a body of case law governs the way in which contracts may be adjusted over time. Performance monitoring and reporting is also regulated through the 1995 Barnier and Mazeaud Laws (Ballance and Taylor, 2005).

Box 4: Civil Laws System

In French jurisprudence and in other Civil Law systems (mostly in Continental Europe, Latin America and Francophone Africa, as well as Quebec), long-term contracts such as concessions are treated as special legal relationships and may include terms like:

- "Fait du Prince": The right of the public authority to unilaterally adjust or cancel the contract, subject to paying compensation.
- "Imprévision": The ability of courts to adjust the contract to restore its financial equilibrium in the face of unexpected and uncontrollable events.

The concept of "financial equilibrium" "does not seem to be well defined, but may imply, depending on the context, the ability of the operator to recover its costs and reasonable profit, or the ability to restore the financial position to what it would have been had certain events not occurred" (Castilia, 2004: 69).

In Common Law systems, which dominate in Canada and most countries of the Commonwealth, concessions are treated as contracts, which means that the parties are free to put more or fewer conditions in the contract.

3.1.2 The Best Form of Partnership

As seen above, in section 2.1, many forms of partnerships are possible. It is the responsibility of governments to select the best forms of PPPs for each specific context. Brook Cowen (1997) determines four types of analysis that should be conducted in order to identify the form of PPP to be entered into: an analysis of the state of the infrastructure; an analysis of the existing regulatory framework; an analysis of those who support and oppose privatization; and, an analysis of the financial viability of different forms of PPPs.

An analysis of the state of the infrastructure is important to assess private sector performances and to avoid costly ex-post renegotiations. For example, an analysis of "the current level and standard of service, the condition of serviceability of assets, the human resources, and the financial performance" is needed (Brook Cowen, 1997: 3). Information about the water system may be lacking or may be too poor to serve as a base for long-term contracts, in which case, means to improve information collection are necessary.

Second, an analysis of the regulatory framework will help government understand which options are feasible. Rees (1998) distinguishes four elements of a regulatory regime: the general framework of laws; water resource and environmental laws; specific water and sanitation regulation; and, the contract under which the firm operates. The general framework of laws and policies, even if not developed with

privatization in mind, affects its activities and thus affects the private sector's decision whether or not to participate in water supply. Water companies will seek protection within the contract terms when regulations and laws fail to protect them against costly changes in water availability or quality and against the introduction of new environmental standards (Rees, 1998). Every law and institution that can affect PPPs must be carefully examined: labour laws, company taxation rules, currency controls, environmental standards and regulatory tools, the power and capacity of any regulatory agencies, and the division of responsibilities between national and various levels of sub-national government.

The support of stakeholders (employees, consumers, environmentalists, government agencies) is essential to the success of PPPs. Hence, it is necessary to have a clear idea before any decision is made of who supports private participation and who opposes it. This will allow an assessment of the risk of political interference and help address the concerns of stakeholders in order to reduce the likelihood of conflict.

Moreover, some private participation options may not be viable if the current water utility tariffs do not cover the costs. For instance, lease and concession contracts and full privatization require full cost pricing. Therefore, an analysis of the financial viability of the different forms of partnerships will be useful to know if the private sector can realistically increase efficiency without increasing prices (Brook Cowen, 1997). It is also useful to gauge the consumers' willingness to pay higher prices, if needed, to make the private company profitable.

Finally, it would also be worthwhile to study the advantages and disadvantages of different restructuring options besides PPPs, including an improved status quo (Bakker, 2003b). The studies should include transaction costs, as they can be a considerable share of the overall costs of the introduction of a new institutional setting. For example, in the health sector, Vining and Globerman (1999) show that even if contracting out usually reduces production costs, these savings are often more than offset by transaction costs. Transaction costs are "costs incurred in searching for the right transaction partner, in elaborating and agreeing on the contract terms, in monitoring performance and in intervening in case of contractual failure" (Rothenberger and Truffer, 2005: 84).

3.1.3 Incentives and oversight mechanisms for PPPs

The public sector also needs to develop tools and institutions to provide well-structured incentives for and oversight mechanisms to control private sector behaviour, through contracts, regulatory agencies, laws, market tools, etc. In other words, the regulatory framework should protect consumers from monopoly abuse, ensure a stable political climate so that operators are secure to invest, and promote competition through performance benchmarks and efficiency through service targets.

A preliminary step is to clearly define the objectives and set clear performance targets. Table 3 gives a list of some regulatory tasks needed to protect consumers under different forms of PPPs. For example, there is a need for some mechanism

to ensure the responsiveness of companies to customer demands, to prevent discriminatory pricing practices and to provide incentives for a good value service. However, in practice these regulatory tasks may not be feasible. "While some of these tasks may be desirable, the capacity of regulators to perform them, the costs involved and the willingness of the private companies to accept restrictions on their activities will all affect what it is practical to implement. As with most aspects of the privatization process, a large dose of realism has to be injected into the design of sector-specific regulations and individual contracts." (Rees, 1998: 104). The nature of the accompanying regulatory regime varies according to the form of partnership. The regulatory burden is heavier under a concession contract or divestment than under management and service contracts (See Table 3).

Table 3: Regulation and Customer Protection

Regulatory tasks	O&M	Lease	Concession	BOT	Full privatization
▪ Price control	-	v	v	v	v
▪ Promotion of operating efficiency	-	v	v	v	v
▪ Service standard specification & monitoring	v	v	v	v	v
▪ Control of externalities	v	v	v	v	v
▪ Maintenance of public good functions	v	v	v	v	v
▪ Ensure asset serviceability over time	-	v	v	v	v
▪ Ensure development of essential infrastructure	-	-	v	-	v
▪ Controls over powers to manipulate land values/land speculation	-	-	v	-	v
▪ Controls over unfair trading practices	v	v	v	v	v
▪ Health and safety regulations	v	v	v	v	v
▪ Promote water-use efficiency	v	v	v	(possibly)	v
▪ Ensure responsiveness to final customer needs	v	v	v	-	v

Notes: O&M = Operations and Maintenance, BOT = Build, Operate, Transfer
Source: Modified from Rees, 1998.

It may be worthwhile to consider the introduction of an independent regulator. Some authors (Baldwin and McCrudden, 1987; Guédon, 1991) argue that independent agencies are justified by the need of expertise in highly complex or technical matters. The separation of the regulatory body from the government is also useful whenever it is hoped to free public administration from political influence. Agencies may also provide greater policy continuity and should be more flexible in policy formulation and in the application of policy to a particular context. Moreover, agencies may favour public participation and are able to focus attention on controversial issues, thus enriching public debate.

In England and Wales, three independent regulatory bodies were introduced under the 1989 water act: the Drinking-Water Inspectorate (DWI) regulates drinking-water quality; the National Rivers Authority (NRA) regulates wastewater discharges; and the Office of Water Services (OFWAT) is in charge of economic regulation. This regulatory framework can exert control on price and environmental and quality standards. It can also ensure that progress towards specific targets is realized (Finger and Allouche, 2002). Moreover, a regulatory framework, if applied to all water utilities, could allow comparisons of performance in the water sector (Bakker, 2003b).

3.2 The Lack of Information in the Water Sector

Much of the case for PPPs relies on the supposed relative efficiency of the private sector; this efficiency depends heavily on the introduction of competition. Experience worldwide shows that there is no major successful model of competition in the water sector and that competition is limited. The restricted potential to introduce competition in water collection and distribution and the fact that water infrastructure is buried and not easily observable, make the asymmetry of information between stakeholders a bigger constraint than in other utility sectors. Moreover, consumers can only partly assess the quality of water (colour, odour and taste) and regular laboratory testing is needed for a complete assessment (Kessides, 2004). Transparency and accountability are thus crucial issues in the water sector.

3.2.1 Competition in the Water Sector

Because of economies of scale, direct competition (see Box 5) in the water sector is uncommon. Most product competition in water markets takes place between water utilities and unpiped sources, such as vendors and wells, and mostly when piped water is over-priced or of poor quality (Kessides, 2004). In the United Kingdom, authorities have tried to introduce some form of direct competition through comparative competition and by allowing third-party access to network infrastructure, but with limited success. Indirect competition for the market through auctioning for the award of a contract is more common in the water sector, but remains a limited form of competition. "Even competition to serve the market before costs are sunk is of limited value, because a single franchise auction will not serve to guarantee efficient pricing and investment over time." (Spulber, 1989: 268).

Box 5: Forms of Competition in Public Services

- **Competition in the market:** service providers compete directly with one another to supply customers. Option for product marker competition include:
    - Competing networks: competing suppliers each establish their own distribution system.
    - Unregulated suppliers: Customers supply themselves (and their neighbours).
    - Cross-border competition: Companies are required to allow connection to their network from outside their areas.
    - Common carriage: Several water utilities use a single network to supply customers, and customers can choose their water supplier.
- **Competition for the market:** potential service providers bid for the right to supply a monopolistic market under a time-bound franchise.
- **"Yardstick" competition:** comparative data on the performance of different service providers are used to simulate some features of competition in the market.

Source: Smith, (2001); Webb and Ehrhardt (1998); Ballance and Taylor (2005).

3.2.1.1 Advantages and Limitations of the Competitive Bidding Process

According to some economists, the technological definition of natural monopoly has to be distinguished from the potential for competition for the right to serve the market (Demsetz, 1968). In other words, even if the production technology requires a single actual producer, the number of potential producers may be quite large. Thus, it is believed that a mechanism can be designed that will take advantage of competition for the right to serve the market so as to achieve desirable objectives – elimination of monopoly rents, efficient pricing, and productive efficiency. But how can such an idealized competition process be designed without introducing the high transaction costs and administrative complexity of traditional regulation? According to Williamson (1976), the complexity of the contracting process and the high level of "transactional detail" that needs to be specified imply that "one also needs to be instructed on how to proceed."

With auctioning, the potential producers bid against each other to obtain the contract. The contract is usually awarded to the bidder that offers to supply water at the lowest price. In that way, competition between bidders (competition for market entry) replaces competition between suppliers in the market. However, investment over time and quality of service is usually not guaranteed by the bidding process itself. "One difficulty with contracting, however, is the tendency to accept the lowest bid for the work without taking sufficient account of the company's ability (or commitment) to provide an acceptable quality of service." (Rees, 1998: 101). Moreover, the price selected by the bidding process is not fixed over the partnership period and may be renegotiated due to change in circumstances, unforeseen events and numerous legitimate (and illegitimate)

pressures. Regulation will thus be needed to ensure that monopoly power does not creep back (Klein, 1996).

In the water sector, where service provision is characterized by long-term contracts and information asymmetries, it is unlikely that a competitive bidding process results in the elimination of monopoly rents, efficient pricing, and productive efficiency as suggested by Demsetz. However, the more competitive the bidding process, the more efficient water suppliers are likely to be. Competitive tenders require a minimum number of bidders. The availability of information is also critical (Kessides, 2004) and governments must ensure that technical and financial information on the water system is fairly and openly disclosed. An open and transparent competitive process is substantially time consuming and costly for both bidders and governments. "In Buenos Aires, for example, the cost of consultants hired to help the government evaluate the bids was an estimated [US]$4 million; in Manila, consultants cost the government $5.2 million and an additional $1 million was provided as a grant by the French Government [...] Each consortium bidding on the Buenos Aires tender reportedly spent about $2-$3 million preparing its proposal. In Manila, the bid preparation costs are reported to be even higher at $5 million per bidder." (Haarmeyer and Mody, 1998: 11).

These high costs are a deterrent for smaller firms, and may explain why there are usually only a few bidders in tendering processes in the water sector. For instance, out of ten water contracts in Latin America, Mexico City had a record number of six bidders, and half of the other water contracts (Barranquilla, Cochabamba, La Paz, Santa Marta, Tucuman) had only one bidder (Foster, 2005). Moreover, the bidders are often a small group of French multinationals that dominate the international water market. Indeed, Suez and Veolia (formerly Vivendi), the two largest French multinationals, hold about 70 percent of the world's privatized water business (Hall, 2002; c.f. Annexe A).

The high costs of competitive processes may also explain in part the frequency of negotiated bids. Anti-competitive behaviour such as negotiated bids, unsolicited bids, strategic misrepresentation, bribery and collusion in the awarding of water sector contracts usually leads to inefficiencies (higher prices, less information disclosure) and frictions among stakeholders (Hodges, 2003).

Unsolicited bids occur when a private firm initiates the infrastructure project proposal in hope of avoiding competitive bidding. Hodges (2003) highlights that the most controversial private infrastructure projects in developing countries originated as unsolicited proposals to governments. Strategic misrepresentation is when a firm discourages potential competitors by strategically underestimating or over-estimating price (Rose-Ackerman, 1999).

A firm competing for a contract can also pay a bribe or give some other favour in order to win. The firm can also do so if it wants to be included in the list of candidates or to exclude other firms, or even to influence the tender conditions or to gain insider information that would lead to an advantage in the bidding process.

After winning the contract a firm may also pay bribes "to obtain a positive business climate or 'friendly' regulation" (Boehm et al., 2005: 266). Since 1999 an anti-bribery convention was introduced by the OECD, which requires member States to criminalize bribery overseas by their own companies.[5] Suez and Vivendi have been implicated in numerous bribes to obtain water contracts, mainly in developed countries (Hall, 2002; see Table 4). In developing countries, while many allegations of corruption have been made, there have been no criminal convictions.

Table 4

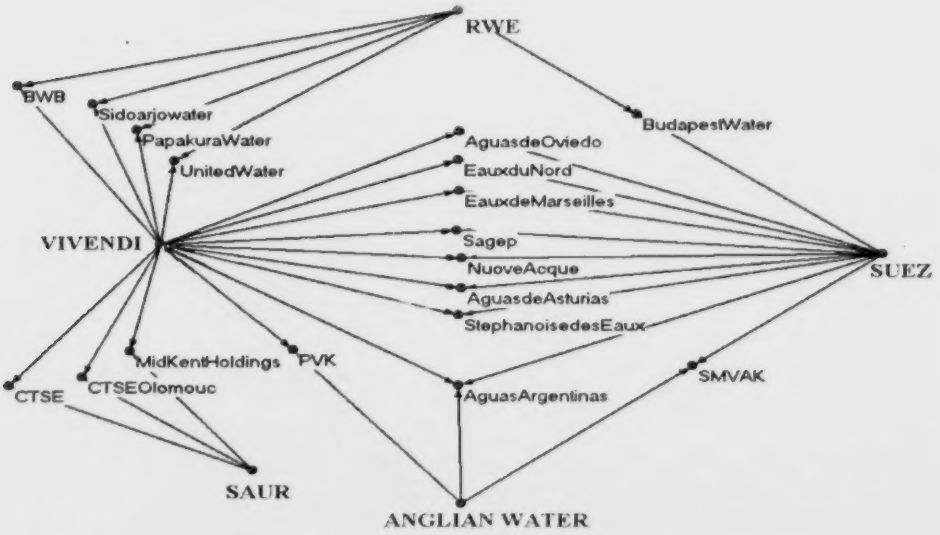
Date of conviction	Location	Parent
2001	New Orleans (U.S.)	Vivendi
2001	Bridgport (U.S.)	Vivendi
2001	Milan (Italy)	Vivendi
1996	Grenoble (France)	Suez
1996	Angouleme (France)	Vivendi
1996	Reunion (France)	Vivendi

Source: Modified from Hall, 2002.

Firms can also collaborate to avoid competition by creating joint ventures. For instance, Thames, SAUR and Anglian, the competitors of Suez and Vivendi, have become partners with Suez and Vivendi in some of their major water operations, in order to establish themselves in the market (Hall, 2002; see Figure 3). In France, in 2002, the Competition Council (Conseil de la concurrence) took action to limit joint venture arrangements between Suez and Vivendi (Ballance and Taylor, 2005).

[5] <http://www.oecd.org/bribery>

Figure 3: Joint Ventures Between Leading Water Multinationals



Source: PSIRU database, 2002. Genrated by V. Popov using Social Network Analysis software. Hall, 2002.

Moreover, experience shows that competition is restricted when contracts are re-tendered because the incumbent has information that gives him an advantage in bidding to retain the contracts. In France, the General Accounting Office identified uncompetitive rolling forward of concessions as a problem (Cour des Comptes, 1997). Furthermore, under concession contracts, the incumbent can ask for compensation for his investment. For example, when the water concession in Valencia, Spain, was re-tendered in the late 1990s, it asked for €54 million compensation for capital investments if it lost the contract; the concession was renewed for a further 50 years (Hall and Lobina, 2004).

3.2.1.2 Comparative Competition

With comparative or "yardstick" competition, the performance of a water monopoly (public or private) is addressed by comparing it with other water companies in different markets or regions (Schleifer, 1985). Performance criteria (product price, leakage levels, investment expenditure, etc.) are determined by the industry average or best practice. Yardstick competition should, in theory, encourage efficiency and refrain monopolists from diverging from least-cost operating practices by acting as an informal pressure on water utilities.

However, yardstick competition is demanding in terms of data and analysis. Costs of different regional monopolies differ due to variations in operating environment and inherited infrastructure, and regulators need to make costs comparable by using econometric methods, which can easily be challenged by companies facing bankruptcy (Williamson and Toft, 2001). Yardstick competition is normally

inherently subjective and thus introduces scope for regulatory opportunism and uncertainty for water companies, which weakens their incentives to invest. Uncertainty may also raise the cost of capital.

Moreover, prohibiting collusion (to protect a threshold number of yardstick comparators) may reduce potential efficiency gains from structural adjustments as the water industry's growth strategy is principally based on acquisitions. It may also reduce the pressure of the capital market on companies by eliminating the threat of takeover.

Yardstick competition has been applied in England and Wales in combination with price-cap regulation (c.f. section 3.3.2); i.e., comparisons between companies are done when setting and resetting price controls. The results of yardstick competition in the United Kingdom are mixed. "In the case of water, it is difficult to imagine how municipal water utilities could be compelled to compete with each other. For example, OFWAT efforts to promote competition in the English water industry seem to have been only partially successful." (Renzetti and Dupont, 2004: 1876).

3.2.1.3 Third Party Access to Water Facilities

In the United Kingdom, the government and OFWAT have tried to increase competition by introducing "inset appointments" and common carriage. Inset appointments – licences issued by OFWAT to new entrants to supply a defined area – allow water companies to compete to supply large consumers (at least 100 million litres a year) in each other's territory, while common carriage requires water providers to offer access to their distribution networks – for a cost-reflective, non-discriminatory fee – so that a competitor can serve its new customers by requesting the assets of the incumbent provider. But the development of cross-boundary competition and common carriage in the U.K. has been limited, and according to Ballance and Taylor (2005) is unlikely to develop further in the future. This is in part due to the problems of monitoring standards and the difference in water quality; i.e., who will be responsible for water quality incidents under common carriage? (Bakker, 2003a).

For common carriage to function, a well-developed regulatory capacity is required. Moreover, controlling relationships between companies that compete while sharing a single network requires complex contracts, metering and payment systems (Webb and Ehrhardt, 1998). The cost of introducing and supporting competition in the water sector can thus be quite high, and even higher than in other sectors due to the lack of information in this sector (Webb and Ehrhardt, 1998). In the U.K., the set up costs for competition have been estimated at $330 million (about CAN$660 million) with annual running costs of $30 million (about CAN$60 million) (Logica, 2000), and these costs do not include the substantial transaction costs involved.

Unlike gas and electricity, experience does not show any major successful model of competition in the water sector (Ballance and Taylor, 2005) and the benefits of

competition are unlikely to be great. The efficiency gains from the limited competition introduced in the water sector may not outweigh their costs.

3.2.2 Transparency and Accountability

The fact that information is uncertain in the water sector makes it crucial to have transparency and accountability to consumers at all stages of the restructuring process. A lack of transparency protects anti-competitive behaviour and usually results in a loss of efficiency. In the case of long term contracts, because of the incomplete nature of contracts (see Box 6) and the uncertainties of future outcomes, transparency and accountability is usually reduced (Bakker, 2003b). Indeed, private companies usually limit access to information for commercial confidentiality and disclosure records are poor (Hall et al., 2002). Hence, increasing managerial autonomy raises the question of how to maintain high levels of accountability and transparency.

Box 6: Incomplete Contracts

Future production, technologies and many other variables cannot be perfectly described contractually today, so that in practice a contract cannot include all the contingencies and is thus incomplete. Contractual incompleteness increases with the duration of the contract.

Williamson (1985) and Grossman and Hart (1986) have shown that the governance structure (in particular, the pattern of ownership of assets) matters when many contingencies are impossible to foresee. Incomplete contracts must constantly be revised and renegotiated as time goes on. Hence, the party who owns the asset will have bargaining power over the other partner (Hart, 1995: 29). In other words, property rights over an asset give the owner the right to make all decisions concerning the asset that are not included in the initial contract.

One way to ensure high levels of accountability and transparency is to involve consumers from the beginning of the privatization decision-making process. "This process will further break the 'information monopoly' of politicians and officials, and enhance community involvement – thereby giving credibility and sustainability to the political process and its outcomes." (Boehm et al., 2005: 266). Also involving consumers in the regulatory decision process can help improve regulatory performance. Consumers' participation will help build local political support for the performance standards set and ensure that such standards conform to local needs and willingness to pay. They should also help reduce the risks of corruption (OECD, 2000: 48). Moreover, there is a need to develop performance measures and indicators of successful PPPs, as well as monitoring schemes and access-to-information guarantees that ensure post-privatization accountability by all parties involved.

In France, the 1995 Barnier and Mazeaud Laws are significant steps in terms of increasing the transparency of the system. These laws establish the arrangements under which the accounts of the private providers may be examined by regional

audit commissions, who can require that the providers prepare formal reports on their technical and financial performance for the municipality for which they provide services (Ballance and Taylor, 2005).

3.3 Diverging Interests of Investors, Consumers and Government

Governments, investors and consumers are involved in a relationship, and their interests are not always convergent. The goal of integrated water resource management is to reconcile efficiency, equity and environmental sustainability. Efficiency implies cost effectiveness, water-use efficiency and maintenance of the assets. The government must also ensure that water distribution is equitable, i.e., that access is available to all at an affordable price and with an adequate quality of service. Finally, to ensure environmental sustainability, the government has to make sure that pollution and damage to water resources are minimized. Therefore, the government is confronted with many objectives and demands and faces a trade off between these three economic, environmental and social goals, the relative weights of which will depend on local conditions (Kessides, 2004).

The interest of consumers is to have safe and affordable water and reliable service. As citizens who elect leaders with the mandate to manage public goods, consumers have a policy role. Because trust is a core requirement for successful PPPs, if there is a lack of transparency or confidence is eroded, PPPs are compromised. Therefore, the success of PPPs depends on the support of consumers. Consumers also have an economic role, contributing directly (through fees) or indirectly (through taxes) to finance PPPs. In small systems, consumers can organize themselves in cooperatives to balance their interests and those of the suppliers. In large systems, however, individual consumers have more limited ways of exercising direct influence and they must rely on the government or independent regulatory agencies (Klein, 1996).

Investors' primary interest is to maximize shareholders' returns, so they will seek to minimize risks. The requirement of low risk and profitability limits investments. "Clearly, the private sector will only operate where certain profitability requirements can be met, which considerably limits the scope for Public-Private Partnerships." (OECD, 2003: 7).

Besides, capital markets look for quick returns, which conflict with the need for long-term investment. Indeed, experience in the United Kingdom shows that there is no evidence that private companies will have incentives to invest in the long term maintenance of water infrastructure (Bakker, 2003a). Because assets are long-lived and capital intensive in the water sector, firms need assurances of adequate returns. "The long pay-back periods for most water infrastructure do not 'fit well' with capital markets in which maturities are typically short. There is, accordingly, a need for the use of guarantee mechanisms so that long-term money is available" (World Bank, 2001: 16).

These diverging interests of the principal stakeholders involved in a partnership and the incomplete nature of contracts will undoubtedly lead to frictions and conflicts. It is therefore indispensable for governments as regulators to

understand the motives of private sector firms for entering into PPPs and to have the skills to manage unknown circumstances over the life of the partnership. Bargaining and negotiations will be part of the relationship, especially for the allocation of risk between the private and public sector, which is at the core of PPPs. The setting of prices can also be considered as a bargaining process as it involves conflicting interaction between investors and consumers.

PPPs have been promoted as a way to bring private sector capital into the mix to attain some of the millennium development goals (MDG) – in particular, to reduce by half the proportion of people without access to safe drinking water and basic sanitation by 2015 (Winpenny, 2003: 2). However, the Camdessus report (Winpenny, 2003) on financing water infrastructure – presented at the 3rd World Water Forum in Kyoto in March 2003 – recognizes that the private sector cannot have a significant role in the rural sector or for very scattered communities. It sees the private sector's role as critical in a world of rapid urbanization, and therefore proposes to provide guarantees against political risk and foreign exchange rate risk, and to finance private sector tendering costs.

3.3.1 Risk Allocation and Bargaining Power

At the core of PPPs are the transfer of risk to the private sector and the principle of optimal risk allocation.

The principle of optimal risk allocation is that risk should be handled by the party best able to manage the risk at the least cost, and higher risks need to be balanced against higher returns for investors. In practice, it is not always clear who should manage the risk, and risk allocation is more the result of bargaining and negotiation than of the ability of parties to manage risks (Bayliss and Hall, 2002).

Power is not balanced between local authorities and multinationals. Municipalities usually do not have the necessary expertise to oversee complex contracts, particularly long term contracts granting a large degree of autonomy to the contractor, such as a design-build-finance-operate (DBFO) scheme (Bakker, 2003b). "As municipalities take on new responsibilities under decentralization programs, they find themselves negotiating multi-million dollar contracts with private companies. For many, this is a new experience. Often, the results are major disparities in bargaining power, particularly when large, international water operating companies are involved." (OECD, 2000: 46). If the project fails, the government remains responsible for providing water services. "Political pressure for the government to bail out large projects (that are too big to fail), and providers of essential services, may mean that the government in fact bears more risk than the contract suggests." (International Monetary Fund, 2004: 22).

Moreover, the private sector increasingly demands guarantees and public subsidies, especially to invest in developing countries. Some of these guarantees, such as take-or-pay contracts (the public sector is bound to pay for set quantities of water irrespective of actual use) or guaranteed rates of return on investment, may impede incentives for private sector performance. "Moreover, efficiency incentives can decrease markedly if, in order to attract the desired investment, it

is necessary to reduce private construction and commercial risks by providing cost overrun guarantees and onerous take-or-pay arrangements." (Rees, 1998: 101).

3.3.2 Setting the Appropriate Price

The existence of significant high levels of irreversible industry-specific investment and of economies of scale in the water sector requires the direct regulation of prices charged by water utilities (either public or private). Since competition is limited, efficient production levels and elimination of monopoly rents cannot be assured. The regulator has to set the price level and the rate structure. The rate setting can be seen as a bargaining process as it involves conflicting interaction between investors who seek to maximize their profits and consumers who seek to minimize their cost (Spulber, 1989: 269). Moreover, pricing has conflicting objectives, such as cost recovery, economic efficiency, equity and affordability and possibly environmental objectives. In practice, there is also a need for administrative simplicity.

Regulators choose a rate structure that has two significant aspects: income distribution and allocative efficiency. First, utility rates must allow the firm to earn profits and consumers must have minimum cost. This establishes a range within which rates determine the size of transfers between consumers and the shareholders of the regulated firm (Spulber, 1989). Second, the rate structure affects the regulated firm's output and input choices and costs and, therefore, the allocative efficiency. The rates can be seen as a compromise between the consumers' interests and those of the regulated firm.

Legal and institutional constraints limit market allocations attainable through regulation. Hence, instead of direct bargaining over rate levels, rates are determined indirectly. Regulators attempt to set prices to achieve rates of return equal to the cost of capital, either with rate of return regulation as in the United States or with United Kingdom price-cap regulation[6] (see Box 7).

[6] Designed by Littlechild in the mid-1980s (Littlechild, 1986, 1988).

Box 7: Price Cap Versus Rate of Return

Pure rate of return

- Frequent discretionary reviews
- Current prices based on previous year's cost
- Regulator fixes price level and price structure
- Relatively low risk

Pure price cap

- Infrequent mandatory reviews
- Future prices based on cost projections
- Regulator fixes level of price index
- Relatively higher risk

Source: Klein (1996: 20).

Unlike American-style rate-of-return regulation in which firms receive a fixed rate of return, price caps define an average price level, on the basis of an estimated cost of capital, not to be exceeded by the firm. The firm is free to adjust its individual prices (within some constraints) and has the flexibility to choose its price structure (Laffont and Tirole, 2000). Price caps give firms the opportunity to retain profits within the price limits, which provides incentives for productive efficiency. The revision of the regulatory constraint is also supposed to be less frequent than with rate-of-return regulation. In the U.K., price limits in the water sector were, originally, to be set by the regulator once every 10 years. It has, however, been revised, a few years after privatization, to five-year intervals between periodic reviews because of the difficulty of accurate forecasting (Bakker, 2003a: 147). For example, between 1990 and 1995, profits were above expected levels because input costs were significantly lower than forecasted (Saal and Parker, 2001). "The expected rate of return was 7% (before financing and corporate taxes); but the water industry's average rates of return had not dropped below 10% since privatization, and were in many instances significantly higher than expected."(Bakker, 2003a: 148).

In the U.K., price caps were intended to involve fewer burdens on regulators and government. But, because of information asymmetries between the regulator and water companies, it was hard for the regulators to decide at what level the price cap should be set. Hence, regulatory scrutiny increased, demanding more information and became more costly (Bakker, 2003a). Frequent reviews also reduce the incentive effect that price caps were designed to generate. Further, regulators have included the expected cost of capital in setting price caps to ensure stable returns for firms, which has created an incentive for firms to inflate investment programmes during the periodic review negotiation process and thus inflate the price cap. This can be considered as variation of the Averch-Johnson effect (see Box 8) identified with respect to rate-of-return regulation (Bakker, 2003a).

Box 8: Averch-Johnson Effect

With rate of return regulation, the rate of return that firms (usually natural monopolies) earn on their capital investment is restricted to be no more than a "fair rate of return", i.e., the firm's profit cannot exceed the regulator – set return on capital. A consequence, first demonstrated by Averch and Johnson in 1962, is that when the rate of return is greater than firms' cost of capital, firms will have a tendency to over-invest, since their profit is a function of their investment. This is known in the economic literature as the Averch-Johnson effect. If the rate of return is lower than the cost of capital, firms will have no incentive to invest. In practice, regulators will either set the rate of return higher or lower than the actual cost of capital, but will almost certainly not get it right.

Source: Averch and Johnson (1962); Flemming and Mayer (1997).

In case of external shocks not in the control of the water company, prices (or caps) may need to be adjusted. Hence, the regulator must decide what is and is not a legitimate reason for price adjustments, which is not always clear in practice. When necessary, the regulator must decide how to compensate the company for changes in costs. Often the price will be indexed to different cost factors (see box 9). Whenever prices are adjusted for certain cost factors, the risk of cost changes is transferred from water companies to consumers (Klein, 1996). The regulator must consider who is better able to handle a specific risk, which, as seen above, is not always obvious. Both the U.K. and France have rules embedded in their regulatory schemes to allow price adjustments for major unpredictable occurrences (Klein, 1996).

Box 9: Price adjustment formula

$$P_{t-1} = \sum_i a_i C_{i,t-1}[1+(I_{i,t}-Z_{i,t})/100]$$

where $\sum_i a_i = 1$

Price in period t (P_t) equals the weighted sum of cost factors at time t-1 ($C_{i,t-1}$) adjusted for an index of cost inflation for cost factor i between period t and t-1 ($I_{i,t}$) and a factor reflecting expected efficiency gains between t and t-1 (Z_i).

Source: Klein (1996:18).

3.3.3 Service to Poor and Remote Areas

It is increasingly recognized that the private sector has little or no interest in poor and thinly populated areas. The poor are not profitable. The costs of provision are usually higher for poorer neighbourhoods, since they are often located far from the existing network or in areas with difficult topographical conditions (Johnstone et al., 1999). Water demand in poorer areas is also usually lower, and the record of payment is poor (Schusterman et al., 2002). Even when the water distribution network already exists, it is difficult to set a price that is both affordable and profitable for the private sector. Hence, water companies will try to find ways to reconcile commercial considerations and the objective of serving the poor by either practicing "cream skimming" or by expecting voluntary work and donation from the community (Finger and Allouche, 2002). The World Bank has also introduced output-based aid (OBA), a new approach which uses targeted subsidies to encourage investment in less profitable areas or for a transition period to full cost-recovery pricing (Brook and Smith, 2001).

Cream skimming is when a company chooses to provide only the most profitable services so as to avoid subsidizing public goods. For example, water companies will prefer to invest in urban areas and will neglect rural ones where the need to improve access to water is the greatest. "According to the latest WHO/UNICEF assessment, of the 1.1 billion who currently lack access to an "improved" water supply, 84 percent live in rural areas." (McCully, 2002: 7). The situation in Canada is much the same, with the majority of unserviced or poorly serviced communities being rural and often remote. Moreover, the introduction of the private sector may increase differences between rural and urban areas (Finger and Allouche, 2002: 173).

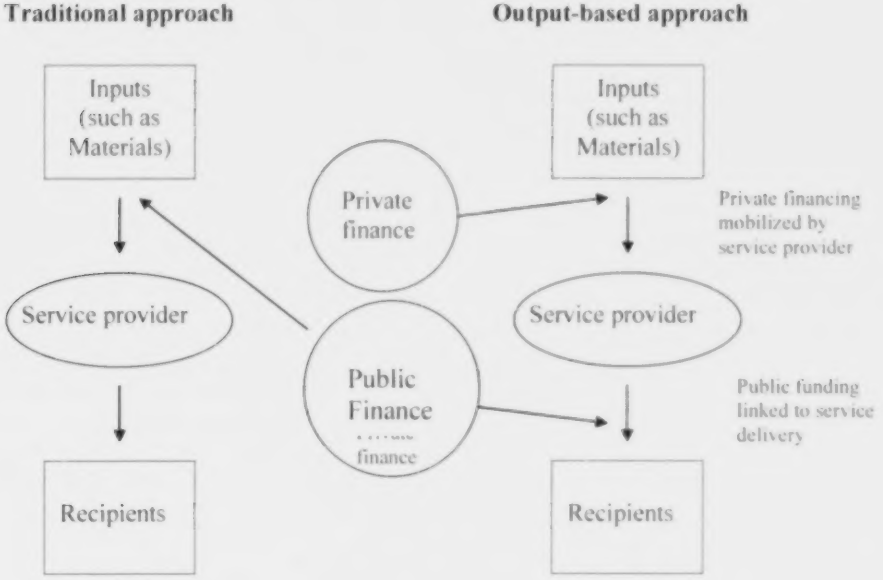
Private operators investing in poor areas will seek to obtain compensation through non-market mechanisms such as voluntary work, collective provision of materials, and cross-subsidy from richer to poorer. In Buenos Aires, four barrios (illegal settlements) that were not in the initial contract were connected to water by Aguas Argentinas because of political and consumer pressure. Municipalities played a crucial role in the last set of renegotiations, and connection charges were financed through a solidarity tax on all consumers. The community also provided free labour (Schusterman et al., 2002).

Output-based aid, unlike other forms of publicly funded subsidy, is a targeted subsidy that focuses on results rather than inputs or processes (see Box 10). OBA approaches have been developed around:

- "Buying down the costs of infrastructure provision via the payment of connection subsidies once a new customer has been connected to an infrastructure service;
- Transitional subsidies to cushion the move to cost recovering tariffs; and/or

- Provision of ongoing subsidies to targeted, disadvantaged groups, for instance, through delivery of payment to an operator of the difference between a life-line tariff (paid for by the household) and the full tariff – again only on the delivery of that service." (Cockburn and Yapp, 2004: 2).

Box 10: Traditional and Output-Based Approaches to Service Delivery



Source: Brook and Petrie (2001: 6).

OBA principally allows reducing investors' risk for consumers unwilling or unable to pay full cost-recovery prices, and transferring performance risk to the private sector by making the subsidy payment conditional on delivery of contracted services. Experiences with OBA have been implemented in different sectors but are in their infancy in the water sector (Marin, 2002). The potential benefits of OBA depend largely on the clarity of the design and must be adapted to the local conditions in which it will be delivered (Smith, 2001). "What is the desired output? What should be the form, level and structure of subsidy? Mis-specified or incomplete indicators can lead to counter-productive or biased behaviour by service providers." (Thomsen, 2005: 32). The process is neither simple nor mechanical. For example, targeting the poor is not an easy task: in Chile, substantial errors of inclusion and exclusion have been made; i.e., some middle-income households have received the subsidy, while some eligible poor households have not (Marin, 2002).

4. Conclusions

During the 1990s, private sector participation in water services provision increased worldwide. But the public provision of water remains the dominant model. The private sector serves only about 5 percent of the total world population (and about 18 percent remains effectively unserved). At the end of the 1990s, multinationals started to exit from some contracts and concessions in developing countries and are now reducing their exposure to projects that are not profitable enough or too risky. However, there are still some attractive markets, especially in developed countries, and the main policy reforms of international organisations remains privatization and decentralization.

PPPs are complex, costly and time-consuming to implement. Because the water sector is capital intensive and most of the investments are irreversible and of no alternative use, organisational and institutional adjustments are needed to provide credible protection for investors so that they can be secure in their investments. It is also important to ensure that institutions exist to provide well-structured incentives to the private sector and to protect consumers against monopoly abuse. Moreover, since there is no "one size fits all' approach, to choose a form of partnership that best fits the local and institutional conditions, many preliminary analyses are required: an analysis of the state of utility, an analysis of the existing regulatory framework, an analysis of those who support and oppose privatization and an analysis of the financial viability of different forms of PPPs.

Experience shows that competition and regulatory policy have more impact on performance than ownership per se. However, unlike the gas and electricity sectors, competition is limited in the water sector. In the United Kingdom, attempts to increase competition have only been partially successful. Auctioning of contracts is the dominant form of competition in the water sector, but it is typically weak. Competitive tenders are costly and time consuming for both bidders and governments and thus rarely occur in practice. The cost of introducing and supporting competition can be very high.

Another challenge of introducing PPPs is the fact that with the increased managerial autonomy of operators, the level of transparency and accountability decreases. So it is important to involve consumers in the decision process from the beginning. Indeed, the success of PPPs depends on the support of consumers, as they contribute directly (through fees) or indirectly (through taxes) to finance PPPs. It is also important to have tools (legislative rules, monitoring schemes, access-to-information guarantees) to ensure high levels of transparency and accountability.

Many objectives have to be considered in the water sector: protection of public health and the environment, accountability, transparency, participation, access for the poor, equity, efficiency and effectiveness. What is the best way to balance all these objectives when the interests of stakeholders do not always converge? Indeed, privatization seems not to be an answer for poor neighbourhoods and rural areas because water companies find such areas not profitable or too risky. And governments are facing a trade off in offering guarantees to private operators

to make investment attractive because in doing so they are increasing their own risk exposure.

Successfully implementing PPPs in the water sector remains a challenging issue for governments. It is crucial for the government to understand the drivers that attract the private sector to enter in PPPs and to develop the knowledge and skills necessary to deal with unknown and unforeseen circumstances during the life of the partnership. Moreover, because of the lack of systematic evaluation of experience, there is no evidence that the benefits of introducing the private sector offset the costs (transactions costs, regulation costs and the costs of introducing competition). There is no clear answer to who are the winners and losers of PPPs; results of experiences worldwide are mixed and depend on the circumstances and the design of the contract. Other options should also be considered, as PPPs are clearly not suited to all circumstances.

Recommendations

1. Good governance

Good water governance is important for both public and private providers and is crucial for successful PPPs. Governance concerns not only the institutions but also the interactions between different levels/bodies of government and the interaction between all the stakeholders involved and the government. Principles of good governance (transparency, accountability, customer focus, health and environmental protection…) are key to sustainable water services and should be at the core of any reform, including PPPs. There is a need to find tools to better implement good governance principles.

2. Public scrutiny

Trust is at the core of a successful partnership. In Canada public resistance to PPPs is strong and has hampered the development of PPPs as an option for water services. Involving the community in the process from the beginning should increase public trust. Contracts should also be made public before they are signed. There is a need to develop monitoring schemes and access-to-information guarantees that ensure accountability by all parties involved.

3. Systematic project evaluation

Many water sector reform projects, including PPPs, have taken place across Canada in the water sector. However, there is no systematic evaluation of performance, of the distributional impacts or of environmental impacts. When PPPs have failed it would be worthwhile to know why. Therefore, systematic evaluation of restructuring projects should be done by municipal and provincial governments.

4. Sharing of information

The lack of information is a major constraint in the water sector, especially for potential private sector entrants, but also for the public sector as a regulator, and for consumers. If PPPs are to go forward, there is a need for a central system that would collect information on projects and allow for sharing of experiences.

5. Independent regulator and oversight of PPPs

Currently PPPs are regulated through contracts. It would be worthwhile to evaluate the potential benefits and costs of having an independent regulator, most probably at the provincial level. This would in principle favour public participation and provide greater policy continuity.

6. Other options have to be considered

PPPs are clearly not suited for all circumstances. It is thus necessary to consider the advantages and disadvantages of many options before selecting one. To be fair, the selection process should involve all relevant stakeholders. There is a need to better understand under what circumstances PPPs are a suitable solution.

References

Akintoye A., M. Beck and C. Hardcastle. 2004. *Public-Private Partnerships: Managing risks and opportunities.* Blackwell Science Ltd.

Armstrong, C. M., S. Cowan, and J. Vickers. 1994. *Regulatory Reform-Economic Analysis and UK Experiencee.* MIT Press

Averch, H. and L. Johnson. 1962. "Behaviour of the Firm Under Regulatory Constraints." *American Economic Review* 52(5): 1052-1069.

Bakker, K. 2003a. *An Uncooperative Commodity: Privatizing Water In England and Wales.* Oxford University Press.

Bakker, K. 2003b. "Good Governance in Restructuring Water Supply: A Handbook" Available at (06/02/15): <http://webapp.mcis.utoronto.ca/resources/pdf/goodgovernance.pdf>

Baldwin, R., and C. McCrudden. 1987. *Regulation and Public Law.* London: Weidenfeld & Nicolson.

Ballance, T., and A. Taylor. 2005. *Competition and Economic Regulation in Water: The Future of the European Water Industry.* IWA Publishing, London UK.

Bayliss, K. and D. Hall. 2002. "Can risk really be transferred to the private sector? A review of experiences with utility privatisation." University of Greenwich: Public Services International Research Unit.

Bhattacharyya, A., T. Harris, R. Narayanan, and K. Raffiee. 1995. "Specification and Estimation of the Effect of Ownership on the Economic Efficiency of the Water Utilities." *Regional Science and Urban Economics* 25(6): 759-784.

Bhattacharyya, A., E. Parker and K. Raffiee. 1994. "An Examination of the Effect of Ownership on the Relative Efficiency of Public and Private Water Utilities." *Land Economics* 70(2): 197-209.

Boehm F., J. Olaya and J. Polanco. 2005 "Privatization and Corruption" in Von Weizsäcker, E.U., O.R. Young, and M. Finger *Limits to Privatization: How to avoid too much of a good thing.* Earthscan, London, 263-267.

Brook Cowen, P. J. 1997. "The Private Sector in Water and Sanitation – How to Get Started", *World Bank Viewpoint* 17318 Washington D.C.: World Bank.

Brook, P.J., and M. Petrie. 2001. "Output-based aid: precedents, promises and challenges" in Brook P. J. and S. Smith *Contracting for Public Services: Output-Based Aid and Its Application.* World Bank: Washington, D.C.

Brook P. J., and S. Smith. 2001. *Contracting for Public Services: Output-Based Aid and Its Application.* World Bank: Washington, D.C.

Brubaker, E. 2003. "Revisiting Water and Wastewater Utility Privatization" Prepared for the Government of Ontario Panel on the Role of Government, Environment Probe.

Bruggink, T. H. 1982. "Public Versus Regulated Private Enterprise in the Municipal Water Industry: A Comparison of Operating Costs" *The Quarterly Review of Economics and Business* 22(1): 111-125.

Buller, H. 1996. "Privatization and Europeanization: The Changing Context of Water Supply in Britain and France." *Journal of Environmental Planning and Management* 39(4): 461-482.

Castalia. 2004. "Final Report on Key Contract Provisions for Long Term PPP in the Water and Sanitation Sector." Volume I, main report, Report to World Bank and Operator Roundtable, Castalia Strategic Advisors.

Clarke, G.R.G., K. Kosec, and S. Wallsten. 2004. "Has Private Participation in Water and Sewerage Improved Coverage? Empirical Evidence from Latin America" World Bank Policy Research Working Paper 3445.

Cockburn, M., and T. Yapp. 2004. "The World Bank: OBA Payment Mechanisms and Risk Mitigation." Cambridge Economic Policy Associates.

Cour des comptes. 1997. "La Gestion des Services Publics Locaux d'Eau et d'Assainissement : Résumé." Accessed February 27, 2006. <www.ccomptes.fr/Cour-des-comptes/publications/rapports/eau/cdc72.htm>

Crain, W. M., and A. Zardkoohi. 1978. "A Test of the Property Rights Theory of the Firm: Water Utilities in the United States." *Journal of Law and Economics* 21(2): 385-408.

Demsetz, H. 1968. "Why regulate utilities?" *Journal of Law and Economics* 11: 55-65.

Essig, F., H. Farina, and P. Delelis. 2000. "L'Encadrement Juridique" In J.Y. Perrot et G. Chatelus *Financement des infrastructures et des services collectifs : Le recours au partenariat public-privé.* Presses de l'école nationale des ponts et chaussées.

Feigenbaum, S., and R. Teeples. 1983. "Public Versus Private Water Delivery: A Hedonic Cost Approach." *Review of Economics and Statistics* 65: 672-678.

Finger, M., and J. Allouche. 2002. *Water Privatisation: Trans-national Corporations and Re-regulation of the Water Industry.* London and New York: Spon Press.

Femming, J., and C. Mayer. 1997. "The Assessment: Public-Sector Investment." Oxford Review of Economic Policy 13(4): 1-11.

Foster, V. 2005. "Ten Years of Water Service Reform in Latin America: Toward and Anglo-French Model." Water Supply and Sanitation Sector Board, Discussion Paper Series No 3, The World Bank Group.

Grossman, S., and O. Hart. 1986. "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy* 94: 691-719.

Guédon, M.J. 1991. *Les Autorités Administratives Indépendantes.* Paris : Librairie Générale de Droit et de Jurisprudence

Haarmeyer, D., and A. Mody. 1998. "Competition, Contracts, and Regulation in Water and Sanitation: Lessons from recent experience." World Bank Water and Sanitation Division, Washington D.C.

Hall, D. 2002. "The Water multinationals 2002-financial and other problems." University of Greenwich: Public Services International Research Unit.

Hall, D. 1997. "Restructuring and Privatisation in the Public Utilities-Europe." University of Greenwich: Public Services International Research Unit.

Hall, D., and E. Lobina. 2004. "Private and public interests in water and energy." Natural Resources Forum 28, United Nations.

Hall, D., E. Lobina, and R. De La Motte. 2003. "Water privatization and restructuring in Central and Eastern Europe and NIS countries." University of Greenwich: Public Services International Research Unit.

Hall, D., E. Lobina, and R. De La Motte. 2005. "Making water privatisation illegal: new laws in Netherlands and Uruguay." University of Greenwich: Public Services International Research Unit.

Hart, O. 1995. *Firms, Contracts and Financial Structure.* Oxford University Press.

Hodges, J. 2003. "Unsolicited proposals: The issues for private infrastructure projects." Note No 257, Private sector and Infrastructure Network, World Bank Group, Washington D.C.

Houstma, J. 2003. "Water Supply in California: Economies of Scale, Water Charges, Efficiency, and Privatization." Mimeo, Mount Allison University

Infrastructure Canada. 2004. *Water Infrastructure: Research for policy and program development.*

International Monetary Fund. 2004. "Public-Private Partnerships" Fiscal Affairs Department.

Izaguirre, A. K. and C. Hunt. 2005. "Private Water Projects: Investments Flows Up by 36 percent in 2004" Note No 297, Public Policy for the Private Sector, The World Bank Group.

Johnstone, N., L. Wood and R. Hearne. 1999. "The Regulation of Private Sector Participation in Urban Water Supply and Sanitation: Realising Social and Environmental Objectives in Developing Countries." Discussion Paper DP99-01, Environmental Economics Programme, International Institute for Environment and Development.

Kessides, I. N. 2004. "Reforming Infrastructure: Privatization, Regulation and Competition." A World Bank Policy Research Report.

Klein, M. 1996. "Economic Regulation of Water Companies" Policy Research Working Paper 1649, Private sector Development Department, World Bank.

Laffont, J. J. and J. Tirole. 2000. *Competition in telecommunications.* MIT Press, Cambridge, Massachusetts.

Levy, B. and P. Spiller. 1996. *Regulation, Institutions and Commitment* Cambridge University Press.

Logica UK. 2000. *Water competition: a way forward: a model to stimulate discussion within the industry.* Leatherhead, U.K.

Lynk, E. 1993. "Privatisation, Joint Production and the Comparative Efficiencies of Private and Public Ownership: The UK Water Industry" *Fiscal studies* 14(2): 98-116.

Marin, P. 2002. "Output-Based Aid (OBA): Possible Applications for the design of Water Concessions" Private Sector Advisory Services, International Finance Corporation, World Bank.

McCully, P. 2002. "Avoiding Solutions, Worsening Problems: A Critique of "World Bank Water Resources Sector Strategy: Strategic Directions for World Bank Engagement Draft for Discussion of March 25, 2002" International Rivers Network.

Meggison, W.L. and J.M. Netter. 2001. "From State to Market: A Survey of Empirical Studies on Privatization" *Journal of Economic Literature* 39: 321-389.

Morgan, D. 1977. "Investor Owned vs. Publicly Owned Water Agencies: An Evaluation of the Property Rights Theory of the Firm." *Water Resources Bulletin* 13(4): 775-781.

OECD. 2000. "Global Trends in Urban Water Supply and Waste Water Financing and Management: Changing Roles for the Public and Private Sectors." Paris: Centre for Cooperation with Non-Members Environment Directorate.

OECD. 2003. "Public-Private Partnerships in the Urban Water Sector." Policy Brief.

Orwin, A. 1999. "Privatization of Water and Wastewater Utilities: An International Survey." Toronto: Environment Probe.

Raffiee, K., R. Narayanan, T. Harris, D. Lambert and J. Collins. 1993. "Cost Analysis of Water Utilities: A Goodness-of-fit Approach." *Atlantic Economic Journal* 21(3): 18-29.

Rees, J.A. 1998. "Regulation and Private Participation In the Water and Sanitation Sector." *Natural Resources Forum* 22(2): 95-105.

Renzetti, S., and D. Dupont. 2004. "The Performance of Municipal Water Utilities: Evidence on the Role of Ownership." *Journal of Toxicology and Environmental Health* Part A, 67: 1861-1878.

Rose-Ackerman, S. 1999. *Corruption and Government: Causes, Consequences and Reform.* Cambridge University Press.

Rothenberger, D. and B. Truffer. 2005. "Private-sector participation in water and sanitation reviewed: Insight from a new institutional economics" in J. Chenoweth and J. Bird. *The Business of Water and Sustainable Development.* Greenleaf Publishing.

Saal, D. and D. Parker. 2000. "The Impact of Privatization and Regulation on the Water and Sewerage Industry in England and Wales: A Translog Cost Function Model." *Managerial and Decision Economics* 21(6): 253-268.

Saal, D. and D. Parker. 2001. "Productivity and Price Performance in the Privatized Water and Sewerage Companies of England and Wales." *Journal of Regulatory Economics* 20(1): 61-90.

Schusterman, R., F. Almansi, A. Hardoy, G. McGranahan, I. Oliverio, R. Rozensztejn and G. Urquiza. 2002. "Experiences with water provision in four low-income barrios in Buenos Aires." PPP and the Poor WEDC/IIED.

Seidenstat, P., M. Nadol and S. Hakim. 2000. *America's Water and Wastewater Industries: Competition and Privatization.* Public Utilities Report.

Shleifer, A. 1985. "A Theory of Yardstick Competition." *The RAND Journal of Economics* 16:319-327.

Smith, W. 2001. "Designing output-based aid schemes: a checklist" in Brook P. J. and S. Smith. *Contracting for Public services: Output-Based Aid and Its Application* World Bank: Washington, D.C.

Spulber, D. F. 1989. *Regulation and Market.s* MIT Press, Cambridge Massachusetts.

Starr, P. 1988. "The Meaning of Privatization" *Yale Law and Policy review* (6), 6-41.

Stephenson, D. 2005. *Water Services Management* IWA, London, UK.

Teeples, R. and D. Glyer. 1987a. "Production Functions for Water Delivery Systems: Analysis and Estimation Using a Dual Cost Function and Implicit Price Specifications." *Water Resource Research* 23(5): 765-773.

_____. 1987b. "Cost of Water Delivery Systems: Specification and Ownership Effects." *Review of Economics and Statistics* 69(3): 399-408.

Thomsen, S. 2005. "Encouraging Public-Private Partnerships in the Utilities Sector: the Role of Development Assistance" NEPAD/OECD Investment Initiative.

Van Bueren, M. and D. Hatton Macdonald. 2004. "Addressing water-related externalities: Issues for consideration" Paper presented at a Water policy Workshop convened by the Australian Agricultural and Resource Economics Society, Melbourne.
<http://www.thecie.com.au/publications/pub_water_consideration.htm>

Vickers, J. and G. Yarrow. 1989. *Privatization: An Economics Analysis* Cambridge, Mass, MIT Press.

Vining, A. R., and A.E. Boardman. 1992. "Ownership Versus Competition: Efficiency in Public Enterprise." *Public Choice* 73: 205-239.

Vining, A. R. and S. Globerman. 1999. "Contracting-out Health Care Services: A Conceptual Framework." *Health Policy* 46.2:77-96.

Webb, M. and D. Ehrhardt. 1998. "Improving Water Services through Competition" The World Bank Group, Finance, Private Sector, and Infrastructure Network, Note No164.

Williamson, O.E. 1976. "Franchise Bidding for Natural Monopolies – in General and with Respect to CATV." *Bell Journal of Economics* 7: 73-104.

Williamson, O. E. 1985. *The Economic Institutions of Capitalism.* New York: Free Press.

Williamson, B. and S. Toft. 2001. "The Appropriate Role of Yardstick Methods in Regulation." NERA: National Economic Research Assistant.

Winpenny, J. 2003. "Report on the World Panel on Financing Water Infrastructure: Financing Water for All." Chaired by M. Camdessus. <http://www.gwpforum.org/gwp/library/FinPanRep.MainRep.pdf>

World Bank. 1994. *World Development Report 1994: Investing in Infrastructure.* New York: Oxford University Press.

World Bank. 2001. "Water Resources Sector Strategy: Concept Note for Discussion with CODE." <http://lnweb18.worldbank.org/ESSD/ardext.nsf/18ByDocName/WaterConceptNoteSeptember2001/$FILE/WaterConceptNoteCODEVersion090701.pdf>

Annexe A

Table 1: Water Sales 2001, (Euro millions)

Company	Water sales (Euro millions)
Ondeo (Suez)	10,088
Vivendi Water	13,640
RWE Thames	2,746
SAUR	2,494
Anglian	936
Cascal	181
IWL (International Water Limited)	100

Company annual reports (except IWL: PSIRU estimates). Thames customers exclude customers on shared contracts, i.e., Adelaide, Berlin, Budapest.
Source: Modified from Hall, 2002.

Table 2: Top Five Sponsors of Water and Sewerage Projects with Private Participation in Developing Countries, 2001-04

Sponsor	Projects	Investment (US$ millions)[1]	East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa
Suez Environment	17	1,053	9	2	1	2	0	3
Veolia Environment[2]	16	1,088	8	6	0	0	0	2
New World Infrastructure	7	292	7	0	0	0	0	0
RWE Thames	6	762	3	1	2	0	0	0
Berlinwasser International	6	135	3	2	0	0	0	1
Total	52	3,330	30	11	3	2	0	6

1. Investment from all sources in projects in which sponsor has a stake of 15 percent or more.
2. Formerly known as Vivendi Environment.
Source: World Bank, PPI Project database (Izaguirre and hunt, 2005).